

Date: September 19, 2000

TO: Faculty of Schools of Engineering

FROM: Faculty of the School of Aeronautics and Astronautics

SUBJECT: Change in Course Title, Course Number and Description of Course Content

The Faculty of the School of Aeronautics and Astronautics has approved the change in the course title, course number, and description of the course content listed below. This action is now submitted to the Engineering Faculty with a recommendation for approval.

FROM:

**AAE 421L Flight Dynamics and Control Laboratory**

Sem. 1 and 2, lab 3, cr. 1 (7 AAE).

Prerequisite or corequisite: AAE 421

Evaluation of flight vehicle dynamics and control systems via analog and digital simulation. Introduction and use of continuous and discrete simulation techniques and equipment. Nonlinear effects, frequency response, stability, time response, systems identification, system design project.

TO:

**AAE 364L Control Systems Laboratory**


Sem. 1 and 2, lab 3, cr. 1

Prerequisite: AAE 364

Enhance student awareness of control systems by providing hands on experience using dynamic systems representative of air and space vehicles. Design of a control system from start to finish by mapping requirements into control solutions through the process of modeling, identification, and controller design (PID and Lead-Lag).

**Reason:** The proposed change in description reflects changes in content. The change in number comes from the change in prerequisite. This course is required of all students in the AAE B.S. program. It must be taken after AAE 364.

APPROVED FOR THE FACULTY  
OF THE SCHOOLS OF ENGINEERING  
BY THE COMMITTEE ON  
FACULTY RELATIONS

  
Thomas N. Farris, Professor and Head  
School of Aeronautics and Astronautics

CFR Minutes # 929

Date 10/11/00

Chairman CFR C.D. Lutton

# AAE 364L

## Control Systems Laboratory

### Description:

Enhance student awareness of control systems by providing hands on experience using dynamic systems representative of air and space vehicles. Design of a control system from start to finish by mapping requirements into control solutions through the process of modeling, identification, and controller design (PID and Lead-Lag).

**Format:** 1 hr. lecture per week, 7 - 2 hr. lab sessions every other week.

**Prerequisite:** AAE 364

**Credit hours:** 1

**Status:** required semester 7

**Course Instructor:** M. Rotea

**Text:** None (class notes and lab manual)

**Assessment Method:** Lab Reports.

### Course Objective:

To enhance student awareness of control systems by providing hands on experience using dynamic systems representative of air and space vehicles. Allow students to understand design of a control system from start to finish by mapping requirements into control solutions through the process of modeling, identification, controller design (PID and Lead-Lag), and controller implementation.

**Experiments:** The instructor may choose from set 1 or set 2 below

#### Set 1

1. Parameter Identification of Rotational Apparatus
2. PID/PIV Control of 1DOF rigid body rotation
3. PID/PIV Control of 2DOF rotation (rigid body plus 1 flexible vibration mode)
4. Open loop control of Helicopter Model
5. Parameter Identification of Helicopter Model
6. PID Control of Helicopter Model

7. Lead-Lag Control of Helicopter Model

**Set 2**

1. to 3. Same as set 1
4. Parameter Identification of Mechanical Pendulum
5. Lead-Lag Control of regular pendulum
6. Lead-Lag Control of inverted pendulum

